UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/052,870	01/18/2002	Zhongming Shi	BP1985	1734

51472 7590 02/22/2006

GARLICK HARRISON & MARKISON LLP
P.O. BOX 160727
AUSTIN, TX 78716-0727

EXAMINER	
PERILLA, JASON M	

ART UNIT	PAPER NUMBER
2638	

DATE MAILED: 02/22/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/052,870	SHI ET AL.	
	Examiner	Art Unit	
	Jason M. Perilla	2638	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *02 December 2005*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-32* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *8-32* is/are rejected.

7)☒ Claim(s) *1-7* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *18 January 2002* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

1. Claims 1-32 are pending in the instant application.

Response to Amendment/Arguments

2. In view of the Applicant's remarks and amendments to the claims filed December 2, 2005, the claim objections and rejections under 35 U.S.C. § 112 have been withdrawn.

3. In view of the Applicant's amendment to the claims, new prior art rejections are set forth below.

Claim Objections

4. Claims 1-7 are objected to because of the following informalities:

Regarding claim 1, in lines 4-5, the limitation of the automatic frequency control circuit which includes "operably disposed to receive communication signals received at radio frequency" is objected to because the automatic frequency control circuit of the instant invention (fig. 7, ref. 704B) does not receive communication signals received at radio frequency. Therefore, the limitation should be stricken from the claim. Further, in line 33, it is suggested that "in-going" is replaced by –received--.

Appropriate correction is required.

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the

applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

6. Claims 8, and 13-17 are rejected under 35 U.S.C. 102(e) as being anticipated by Baldwin et al (US 6560448; hereafter "Baldwin").

Regarding claim 8, Baldwin discloses by figure 2 a transceiver (abstract), comprising; a transceiver port (247, 249) for receiving and transmitting radio frequency communication signals; an automatic frequency control circuit (231) for adjusting a local oscillation (LO) (229) based upon the center frequency (col. 8, line 41; "2.4 GHz") of a received radio frequency (RF) signal (col. 8, lines 25-45); circuitry for down converting (265, 267) the received RF signal; and circuitry (284, 293, 295, 269, and 271) for removing a direct current (DC) offset and low frequency interference (col. 6, lines 42-60; col. 10, lines 13-33).

Regarding claim 13, Baldwin discloses the limitations of claim 8 as applied above. Further, Baldwin discloses that the automatic frequency control circuitry comprises signal generation circuitry (fig. 2, refs. 229, 227) that provides quadrature phase shift keyed or in-phase and quadrature signals.

Regarding claim 14, Baldwin discloses the limitations of claim 8 as applied above. Further, Baldwin discloses that the automatic frequency control circuitry (fig. 2, refs. 229, 231 and 227) receives base band quadrature signals output from the local oscillator (fig. 2, ref. 229) and produces an adjusted local oscillation (LO) signal (fig. 2, output from ref. 227) output from a local oscillator.

Regarding claim 15, Baldwin discloses the limitations of claim 8 as applied above. Further, Baldwin discloses filter circuitry for removing a DC offset (fig. 2, ref. 269, 271). The filters 269 and 271 receive feedback from the logic controller via control lines IDC_{OFF} and QDC_{OFF} to remove a DC offset.

Regarding claim 16, Baldwin discloses the limitations of claim 8 as applied above. Further, Baldwin discloses filter circuitry for removing low frequency interference (fig. 2, ref. 269, 271). Filters 269 and 271 are low pass filters (LPF).

Regarding claim 17, Baldwin discloses the limitations of claim 8 as applied above. Further, Baldwin discloses an up converter (fig. 2, ref. 223, 225) for up converting base band signals to radio frequency signals for transmission from the transceiver port (fig. 2, ref. 247, 249).

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

8. Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over Baldwin.

Regarding claim 18, Baldwin discloses the limitations of claim 8 as applied above. Further, Baldwin discloses calibration circuitry (fig. 2, ref. 284) for automatically tuning the on chip filters (fig. 2, ref. 269, 271). The filters 269 and 271 receive feedback from the logic controller via control lines IDC_{OFF} and QDC_{OFF} to remove a DC offset. Baldwin does not explicitly disclose that the filters (269, 271) comprise resistive

capacitive elements. However, as understood by one having ordinary skill in the art, filters comprise resistive and capacitive elements. Therefore, it would have been obvious to one having ordinary skill in the art at the time which the invention was made that the calibration circuitry (fig. 2, ref. 284) would calibrate resistive capacitive filters (269, 271) via the control lines IDC_{OFF} and QDC_{OFF}.

9. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Baldwin in view of Abramsky et al (US 6052566; hereafter "Abramsky").

Regarding claim 9, Baldwin discloses the limitations of claim 8 as applied above. Baldwin does not disclose dual received signal indication circuits, which dual received signal indicator circuits are for measuring received signal power and received signal and interference power. However, Abramsky teaches the use of received signal strength indicators for the proper adjustment of variable gain amplifiers. The variable gain amplifiers (fig. 1, refs. 261 and 273) of Baldwin are controlled by the logic controller (fig. 1, ref. 284), but Baldwin does not explicitly provide for the means used to determine the amount of gain adjustment needed. Abramsky teaches that received signal strength indicators (fig. 1, ref. 145) are used to adjust variable gain amplifiers (fig. 1, ref. 115 and 125; col. 1, lines 55-65). Abramsky teaches that the received signal strength indicators are advantageously utilized to provide acceptable performance across a wide range of environments by balancing the noise in the system (col. 1, lines 55-65). Therefore, it would have been obvious to one having ordinary skill in the art at the time which the invention was made to utilize received signal strength indicators as taught by Abramsky in the transceiver of Baldwin because they could provide acceptable performance

across a wide range of environments by balancing the noise in the system. In the transceiver of Baldwin in view of Abramsky, two received signal strength indicators (RSSI) would be applied. One RSSI unit would be utilized to measure the received signal and power to adjust the gain of the first variable gain amplifier (fig. 1, ref. 261) of Baldwin via the logic controller, and a second RSSI unit would be utilized to measure the received signal power to adjust the gain of the second variable gain amplifier (fig. 1, ref. 273, 275) of Baldwin via the logic controller.

10. Claims 10-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Baldwin in view of Ichihara (US 2002/0047744).

Regarding claim 10, Baldwin discloses the limitations of claim 8 as applied above. Baldwin discloses variable gain amplification circuitry (fig. 1, ref. 273, 275) but does not explicitly disclose high pass variable gain amplification circuitry. However, Ichihara teaches the use of variable gain amplifiers coupled with high pass filters to reduce DC offset (fig. 7). Ichihara teaches that a plurality of high pass (C-cut) filters each coupled with a variable gain amplifier connected in series can remove a DC offset while uniformly amplifying a signal (para. 0014-0017, 0068). Further, Ichihara teaches that the DC blocking gain control circuit shown in figure 7 can be adjusted evenly and gradually with the plurality of variable gain amplifiers to suppress any sudden change in transient (DC) voltage (para. 0080). Therefore, it would have been obvious to one having ordinary skill in the art at the time which the invention was made to utilize the high pass (C-cut) filter and variable gain arrangement as taught by Ichihara (fig. 7) in place of the variable gain amplifiers of Baldwin because they could be advantageously

be used to remove any DC offset while gradually and evenly amplifying the received signal.

Regarding claim 11, Baldwin in view of Ichihara disclose the limitations of claim 10 as applied above. Further, in the transceiver of Baldwin in view of Ichihara, the transceiver includes first high pass filter and variable amplifier (Ichihara; fig. 7, refs. 108, 102), second high pass filter and variable amplifier (fig. 7, refs. 109, 103), and third high pass filter and variable amplifier (fig. 7, refs. 110, 104).

Regarding claim 12, Baldwin in view of Ichihara disclose the limitations of claim 11 as applied above. Further, in the transceiver of Baldwin in view of Ichihara, the transceiver includes first high pass filter and variable amplifier (Ichihara; fig. 7, refs. 108, 102), second high pass filter and variable amplifier (fig. 7, refs. 109, 103), and third high pass filter and variable amplifier (fig. 7, refs. 110, 104).

11. Claims 19-23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Baldwin in view of Katayama et al (U.S. 6275542; hereafter "Katayama").

Regarding claim 19, Baldwin discloses according to figure 2 a method in a high data rate communication transceiver (abstract) comprising: receiving (247 and 249) and amplifying (261) wideband high data rate radio frequency (RF) communication signals; adjusting (231) a local oscillation (LO) frequency (229); down converting (265 and 267) the received signals from RF to base band frequency; and applying the down converted base band frequency signals to low pass filters (269 and 271) and amplifiers (273 and 275). Baldwin does not explicitly disclose that the adjusting of a local oscillation frequency compensates for a difference in a received frequency and an expected

frequency of the received high data rate RF communication signals. However, Katayama discloses an automatic frequency control (fig. 2, ref. 3) circuit which adjusts the local oscillation frequency based on a detected difference (fig. 2, ref. 11) between actual and expected (i.e. local oscillation) frequencies of the received communication signals (col. 6, lines 35-45; col. 7, lines 15-25). Katayama teaches that the frequency control is advantageously utilized to nullify the frequency error (col. 7, lines 30-35). Therefore, it would have been obvious to one having ordinary skill in the art to adjust the automatic frequency control circuit using the detected difference between the local and received signal frequencies as taught by Katayama in the circuit of Baldwin because it provides the advantage of nullifying frequency error which could not be achieved using only *a priori* information alone.

Regarding claim 20, Baldwin discloses the limitations of claim 19 as applied above. Further, Baldwin discloses removing a DC offset (col. 6, lines 42-60; col. 10, lines 13-33).

Regarding claim 21, Baldwin discloses the limitations of claim 19 as applied above. Further, Baldwin discloses removing low frequency interference via low pass filters (fig. 2, refs. 269, 271).

Regarding claim 22, Baldwin discloses the limitations of claim 19 as applied above. Further, Baldwin discloses sensing a power level of the received signals (col. 10, lines 13-18) so that a gain of the received signals could be adjusted by the feedback signal G_{ADJ} (fig. 2).

Regarding claim 23, Baldwin discloses the limitations of claim 19 as applied above. Further, Baldwin discloses sensing a power level and interference of the received signals (col. 10, lines 13-18) so that a gain of the received signals could be adjusted by the feedback signal G_{ADJ} (fig. 2). It is necessary to receive any interference coupled with the received signal while sensing the power level of the received signal because any interference is superimposed upon the received signal.

12. Claims 24-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Baldwin in view of Katayama, and in further view of Abramsky.

Regarding claim 24, Baldwin in view of Katayama disclose the limitation of claim 19 as applied above. Baldwin in view of Katayama do not explicitly disclose that a first amplification level is based upon a ratio of signal to noise and interference levels. However, Abramsky teaches the use of received signal strength indicators for the proper adjustment of variable gain amplifiers. The variable gain amplifiers (fig. 1, refs. 261 and 273) of Baldwin are controlled by the logic controller (fig. 1, ref. 284), but Baldwin in view Katayama do not explicitly provide for the means used to determine the amount of gain adjustment needed. Abramsky teaches that received signal strength indicators (fig. 1, ref. 145) are used to adjust variable gain amplifiers (fig. 1, ref. 115 and 125; col. 1, lines 55-65). Abramsky teaches that the received signal strength indicators are advantageously utilized to provide acceptable performance across a wide range of environments by balancing the noise in the system (col. 1, lines 55-65). Therefore, it would have been obvious to one having ordinary skill in the art at the time which the invention was made to utilize received signal strength indicators as taught by Abramsky

in the transceiver of Baldwin in view of Katayama because they could provide acceptable performance across a wide range of environments by balancing the noise in the system. In the transceiver of Baldwin in view of Katayama, and in further view of Abramsky, two received signal strength indicators (RSSI) would be applied. One RSSI unit would be utilized to measure the received signal and power to adjust the gain of the first variable gain amplifier (fig. 1, ref. 261) of Baldwin via the logic controller, and a second RSSI unit would be utilized to measure the received signal power to adjust the gain of the second variable gain amplifier (fig. 1, ref. 273, 275) of Baldwin via the logic controller.

Regarding claim 25, Baldwin in view of Katayama, and in further view of Abramsky disclose the limitations of claim 24 as applied above. Further, in the transceiver of Baldwin in view of Abramsky, a second amplification level (the gain of the variable gain amplifier fig. 2, ref. 261) would be based upon a signal to noise and interference power level because the RSSI indicator would measure a signal to noise and interference level to accordingly adjust the power level of the variable gain amplifier.

Regarding claim 26, Baldwin in view of Katayama, and in further view of Abramsky disclose the limitations of claim 25 as applied above. Further, the purpose of the adjustment of the amplification of the variable gain amplifiers of Baldwin is to provide the correct amount of amplification. Therefore, it would have been obvious that the first and second amplification levels, collectively, would provide the correct amount of amplification for the transceiver.

13. Claims 27 and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Baldwin in view of Katayama, and in further view of Talwalkar et al (US Pub. No. 2003/0026361; hereafter "Talwalkar").

Regarding claim 27, Baldwin in view of Katayama disclose the limitations of claim 19 as applied above. Baldwin in view of Katayama do not disclose receiving center channel information from a pilot signal to determine the difference between the received RF frequency and the expected frequency. However, Talwalkar teaches that a pilot signal may be advantageously used to correct a difference between a received frequency and the expected frequency (abstract). Talwalkar teaches that a pilot signal is typically inserted more frequently in data to make automatic frequency correction fast and accurate (para. 0005). Therefore, it would have been obvious to one having ordinary skill in the art at the time which the invention was made to use a pilot signal to determine the difference between the received RF frequency and the expected frequency as taught by Talwalkar in the method of Baldwin in view of Katayama because the use of pilot signals in automatic frequency correction permits fast and accurate frequency correction.

Regarding claim 28, Baldwin in view of Katayama, and in further view of Talwalkar disclose the limitations of claim 27 as applied above. Further, as broadly as claimed, the actual center frequency of the received signal is determined according to Talwalkar using the pilot signals (para. 0005).

14. Claims 28-32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Baldwin in view of Katayama, and in further view of Ichihara (US 2002/0047744).

Regarding claim 29, Baldwin discloses a transceiver (fig. 2), comprising: frequency control circuitry (231); filtering circuitry (269 and 271) to remove low frequency interference; and multiple high pass variable gain amplifier circuits (273 and 275) coupled to receive the output of the filtering circuitry and wherein the high pass variable gain amplification circuits provide signal amplification. Baldwin does not explicitly disclose that the frequency control circuitry is operable to compensate for a detected difference between an actual frequency of the received communication signals and an expected frequency of the received communication signal. However, Katayama teaches such operation via a frequency locked loop as applied to claim 19 above. Baldwin in view of Katayama do not explicitly disclose that the filtering circuitry removes a direct current (DC) offset. However, Ichihara teaches the use of a filtering circuit that removes a DC offset as applied to claim 10 above.

Regarding claim 30, Baldwin in view of Katayama, and in further view of Ichihara disclose the limitations of claim 29 as applied above. Further, in the circuit of Baldwin in view of Katayama, and in further view of Ichihara, the frequency control circuitry (Baldwin; fig. 2, ref. 231) includes circuitry (Katayama; fig. 2, ref. 3) for measuring a center channel frequency (col. 6, lines 35-45; col. 7, lines 15-25) and for determining a difference (Katayama; fig. 2, ref. 11) between the measured center channel frequency and a specified center channel frequency (Baldwin; 229).

Regarding claim 31, Baldwin in view of Katayama, and in further view of Ichihara disclose the limitations of claim 31 as applied above. Further, Baldwin discloses signal

generation circuitry (fig. 2, ref. 209) for generating quadrature phase shift keyed signals (fig. 2, output of 211 and 213).

Regarding claim 32, Baldwin in view of Katayama, and in further view of Ichihara disclose the limitations of claim 32 as applied above. Further, Baldwin discloses a mixer (fig. 2, ref. 227) for producing local oscillator output signals at a specified frequency. The specified frequency is the particular frequency of the carrier of the received signals.

Allowable Subject Matter

15. Claims 1-7 are indicated to contain allowable subject matter.

16. The following is a statement of reasons for the indication of allowable subject matter:

Claims 1-7 are indicated to contain allowable subject matter because the prior art of record does not anticipate or obviate the claimed two received strength signal indicators wherein one is upstream a filter and one is downstream the filter.

Conclusion

17. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not

mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

18. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jason M. Perilla whose telephone number is (571) 272-3055. The examiner can normally be reached on M-F 8-5 EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chieh M. Fan can be reached on (571) 272-3042. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Jason M. Perilla
February 16, 2006

jmp

CHIEH M. FAN
SUPERVISORY PATENT EXAMINER